ORIGINAL ARTICLE

Knowledge and Attitudes of Primary Care Physicians Toward Sleep and Sleep Disorders

Klara K. Papp, Ph.D.,[1] Carolyn E. Penrod, M.D.,[2] and Kingman P. Strohl, M.D.[3]

ABSTRACT

Purpose: To assess primary care physician (PCP) sleep knowledge and attitudes. Method: A sample of 580 PCPs practicing adult medicine in Northeast Ohio was selected, using a systematic random method (every 10th name on the American Medical Association mailing list). A three-part structured survey consisted of 30 attitude items and 33 multiple-choice test questions assessing knowledge, with some demographic questions. Repeat mailings were sent to nonrespondents 4 to 6 weeks apart from October 1999 through April 2000. Results: 46 surveys were undeliverable and 105 (20%) useable questionnaires were returned. Of respondents, 94% were board certified with 76% certified in more than one area. When asked to rate their knowledge of sleep disorders, none rated themselves as excellent, 10% rated themselves as good, 60% as fair, and 30% as poor. The factors rated highest in influencing current practices regarding sleep and sleep disorders were articles in journals, continuing medical education courses, and discussions with specialists. Knowledge average was 34% (3 to 94%). Though virtually all agreed that prevention counseling should be a part of patient care, fewer agreed that they spend more time counseling patients on the benefits of sleep than of diet or exercise. Conclusions: The majority of PCPs rated their own knowledge of sleep disorders as fair or poor. Knowledge testing and attitude assessment lend credence to these perceptions.

KEYWORDS: Sleep and sleep disorders, health promotion, medical curriculum, primary care physician survey

Sleep and Breathing, volume 6, number 3, 2002. Address for correspondence and reprint requests: Klara K. Papp, Ph.D., GRECC 111C(W), Louis B. Stokes Cleveland VA Medical Center, 10701 East Boulevard, Cleveland, OH 44106. E-mail: klara.papp@med.va.gov. [1]Case Western Reserve University, School of Medicine, Department of Medicine, University Hospitals of Cleveland, and Geriatric Research Education and Clinical Center, Louis B. Stokes Cleveland VA Medical Center; [2]Case Western Reserve University School of Medicine; [3]Division of Pulmonary and Critical Care Medicine, Case Western Reserve University, and the Louis B. Stokes Cleveland VA Medical Center, Cleveland, Ohio. 1520-9512,p;2002,06,03,103,110, ftx,en;sbr00209x.

Sleep and lack of sleep are common human behaviors and experiences. In the community, predominant causes for disorders of sleep maintenance and excessive sleepiness are personal sleep habits and choices for voluntary sleep restriction, poor timing of planned sleep, and/or chronic ingestion of coffee, tea, and antihistamines. There is now evidence that medical disorders of sleep are relatively common and that there is an important impact of sleepiness on the risk for fatigue-related car crashes, errors, and other accidents.[1–3]

Given the prevalence of sleep disorders, concern has existed for the past 2 decades that primary care physicians (PCPs) do not fully appreciate these illnesses.[4–6] Recognition of obstructive sleep apnea hypopnea syndrome (OSAHS) is important because treatments exist that reduce the risk of fall-asleep crashes and cardiovascular risk (hypertension and angina) produced by the sleep disruption.[7,8] However, features of OSAHS include sleepiness and snoring, two symptoms on which there is little emphasis in medical training.[9] Furthermore, excessive sleep restriction routinely occurs in graduate physician training programs and, as such, complaints by patients of sleep and sleepiness may be dismissed by physicians as "normal."

In order to improve the profile of sleep disorders in primary care, it is important to know practitioners' attitudes and assess their knowledge of sleep and sleep disorders. There is no precedent for a survey on sleep that compares attitudes to related lifestyle behaviors or other conditions. Our survey was developed with such a purpose and relied upon methods and formats previously used to assess physician knowledge and attitudes relevant to other illnesses[10,11] or physician behaviors.[12] Our purpose was to assess PCPs' knowledge and attitudes about sleep relative to other lifestyle issues, to assess their opinions about the place in the medical curriculum where sleep topics should be taught, and to ascertain their perceptions of factors that influence change in their practice of medicine.

METHOD

Study Population and Survey Sample Using a mailing list of all practicing primary care practitioners who treat adults (general internists, family physicians, and general practitioners) in Northeast Ohio provided by the American Medical Association, we selected every 10th physician on the list. Thus, a total of 580 physicians were identified from a file of close to 6,000 practicing PCPs in Northeast Ohio.

Survey Instrument The 92-item structured survey was piloted with PCPs at Case Western Reserve University (CWRU) School of Medicine using PCPs. The survey consisted of the following:

- 30 attitude items required respondents to indicate their opinion on a Likert-type scale where 5 = Strongly Agree to 1 = Strongly Disagree. Responses to healthy lifestyle items other than sleep were compared to items related to sleep.
- 33 multiple-choice questions assessing knowledge about sleep were included.
- 15 items measured perceptions of the appropriate place in medical training for various facets of information about sleep.
- 7 items assessed the influence of sources of information on current practice style regarding sleep and sleep disorders.

Survey Procedures The self-administered, mail-in survey was distributed using a modified Dillman method.[13,14] We mailed the survey initially, followed by a postcard reminder to nonrespondents after 4 weeks. After another 4 weeks, we sent the survey to nonrespondents. We mailed the survey in three separate mailings each about 4 to 5 weeks apart from October 1999 through April 2000 (excluding a 4-week block of time at the end of the year in December 1999 and early January 2000).

Statistical Analysis Results were entered into an SPSS 9.0 dataset and analyzed using descriptive statistics and chi square tests as appropriate.

RESULTS

Survey Respondents A total of 46 surveys were returned marked either undeliverable, that respondents did not consider themselves primary care practitioners, or that they had recently retired from practice. In all, 105 of the 534 physicians in our sample responded (20%). Of these, 27% were female and 73% male; respondents had graduated from medical school from 1964 to 1997; 94% were board certified of whom 76% were certified in more than one area. When comparing respondents to nonrespondents, women in our sample responded at a higher frequency than did men physicians (34% of women vs. 24% of men; $p = .02$ using the chi square test). Differences in response rate were not associated with geographic region.

Attitudes Sleep attitudes were clustered and compared to attitudes about other healthy lifestyle issues in Table 1. The majority of physicians surveyed agreed or strongly agreed that obstructive sleep apnea is a potentially life-threatening as well as a common problem. About three fourths agreed that inadequate sleep is a major health problem. On average, almost 95% agreed that prevention counseling should be a part of patient care, yet only about 80% responded that prevention of sleep disorders is possible. Over 80% responded that they spend time discussing the benefits of exercise and diet, even if this reduced the number of patients that they see; yet fewer than half (approximately 40%) responded that they spend time counseling patients about the benefits of adequate sleep. There were no apparent differences between the perceptions of cost-effectiveness of counseling patients on sleep and sleep problems compared to proper diet and or exercise (Table 1).

Knowledge Physicians who left five or more questions unanswered were omitted from the analysis ($n = 7$). The overall mean score on multiple-choice questions assessing knowledge was 34%; scores ranged from a low of 3% to a high of 94%; overall mean = 12 (36%), StdDev = 6. Table 2 lists the top and bottom five items that were answered correctly. Most physicians knew that the incidence of gastrointestinal disorders is higher in shift workers, while only 60% responded correctly that the need for sleep does not decrease in persons over 50 years of age. Fewer than 20% correctly identified that most people doze off at the wheel of a car midafternoon and early morning (corresponding to the circadian cycle) or that restless leg syndrome during sleep may be associated with end-stage renal disease.

Where Should Information on Sleep Be Taught in the Medical Curriculum? Most respondents indicated that with the exception "physiology of sleep," which should be taught in the first 2 years of the medical curriculum, all other topics should be taught at all levels of clinical training: during the second 2 years of medical school, during residency, and in continuing medical education (CME) courses (see Table 3).

Influences on Medical Practice Physicians responded that articles in medical journals have the greatest influence on their current practice style regarding sleep and sleep disorders. This is followed by CME courses, discussions with specialists, and peers. Not surprisingly, factors rated as having lower influence on practice styles are textbooks, prior training, and clinical practice guidelines (see Table 4).

DISCUSSION

Results indicate that there is wide variation in knowledge among PCPs about sleep disorders, but the trend is a low rate of expertise and comfort. This may be understandable since these practitioners did not rate sleep behaviors and disorders as high in importance in maintaining health as they

Table 1 Statements Clustered by Content Listed According to Strength of Agreement by Primary Care Physicians Using a Likert Scale*

	Mean (Std Dev)	% Strongly Agree or Agree
Sleep Issues		
1. Obstructive sleep apnea is a potentially life-threatening problem.	4.2 (0.7)	90
2. Obstructive sleep apnea is a common problem.	3.9 (0.7)	84
3. Inadequate sleep is a major health problem.	3.8 (0.8)	70
4. A sleep history is essential to comprehensive evaluation of every patient.	3.7 (0.7)	68
5. My medical society encourages the recognition of sleep disorders.	3.2 (0.8)	33
6. I have written information that I give patients regarding sleep hygiene.	2.5 (1.1)	25
7. Telling my patients to get more rest improves most sleep complaints.	2.4 (0.7)	13
8. Apart from listening with empathy, there is little I can do about older persons and their sleep problems.	1.9 (0.5)	0
9. Alcohol promotes sleep quality.	1.6 (0.8)	6
Prevention		
1. Preventing an illness is gratifying	4.6 (0.5)	98
2. In my experience, smoking cessation is an effective preventive measure even if patients have engaged in many years of smoking.	4.5 (0.7)	91
3. Prevention counseling should be a part of patient care.	4.4 (0.7)	94
4. I have an obligation to improve the health of the community.	4.3 (0.8)	91
5. Prevention of sleep disorders is possible.	3.8 (0.6)	79
6. Prevention of car crashes is part of my role as a physician.	3.6 (1.0)	60
7. Most sleep disorders are NOT preventable.	2.2 (0.8)	6
Counseling		
1. Influencing patients to adopt healthier lifestyles is important to my effectiveness.	4.3 (0.6)	94
2. If patients do not express an interest in making lifestyle changes, I am still obligated to counsel them on changing bad habits.	4.2 (0.6)	94
3. I spend time discussing the benefits of exercise even if this reduces the number of patients I see.	4.0 (1.0)	80
4. I counsel patients about diet even if this reduces the number of patients I see.	3.9 (0.9)	79
5. Patients expect health promotion counseling as part of routine care.	3.9 (0.7)	76
6. Behavior modification is effective in my practice.	3.7 (0.8)	66
7. Counseling about sleep hygiene is a necessary part of routine care by all physicians, regardless of specialty.	3.5 (1.0)	55
8. I spend time counseling my patients about the benefits of adequate sleep even if this reduces the number patients that I see.	3.1 (1.1)	43
9. Health professionals, other than physicians, should provide most of the counseling for sleep and sleep problems.	2.6 (0.9)	20
10. Counseling patients about adequate sleep is NOT important compared to counseling them about diet and exercise.	2.4 (0.9)	16
Cost-Effectiveness: It is NOT cost-effective to counsel patients on		
11. Sleep and sleep problems.	2.5 (0.9)	16
12. Proper diet.	2.1 (1.0)	13
13. Exercises.	2.0 (1.0)	14

*Items were rated 5 = Strongly Agree, 4 = Agree, 3 = Uncertain, 2 = Disagree, 1 = Strongly Disagree.

Table 2 Percentage of Primary Care Physicians (n = 98*) Who Answered the Top-Five and Bottom-Five Multiple-Choice Test Questions Correctly Listed in Descending Order of Difficulty

	% Correct
Top 5 Items	
1. Incidence of gastrointestinal disorder is higher in shift workers compared to workers with steady daytime hours.	91
2. Dream sleep (REM) occupies about ¼ of the night.	69
3. The need for sleep does not decrease in persons over 50 years of age.	60
4. Neither opening a car window, turning up the radio, nor chewing gum will keep a drowsy driver awake.	54
5. Report of insomnia is more common in women than in men.	54
Bottom 5 Items	
5. Midol and Dexatrim diet pills contain caffeine or another stimulant.	19
4. More people doze off at the wheel of a car midafternoon and early morning.	17
3. Tonsillectomy is often an effective treatment of sleep apnea in young children.	15
2. Periodic limb movements of the legs or arms during sleep are associated with end stage renal disease.	13
1. More drunk-driving related accidents occur in the evening 5–12 midnight	6

*Physicians who left five or more questions blank were omitted from this analysis.

Table 3 The Number of Primary Care Physicians* Who Responded to the Question "Where Should Information on Sleep and Sleep Disorders Be Taught? by Topic

	N (%)			
	Medical School (Basic Science Years)	**Medical School (Clinical Years)**	**Graduate (Residency)**	**CME**
Physiology of sleep	78 (74)	70 (67)	46 (44)	63 (60)
Causes and differential diagnosis of sleepiness	40 (38)	93 (87)	75 (71)	75 (71)
Epidemiology of sleep disorders	41 (39)	79 (75)	63 (60)	68 (65)
Sleep habits and assessment of sleep need	28 (27)	86 (82)	74 (71)	70 (67)
Diagnostic procedures for sleep disorders	20 (19)	77 (73)	85 (81)	78 (74)
Treatment of sleep disorders	16 (15)	83 (79)	89 (85)	86 (82)
Prevention of sleep disorders	23 (22)	83 (79)	83 (79)	86 (82)
Impact of sleep on cardiovascular disease	36 (34)	81 (77)	79 (75)	80 (76)
Sleepiness and the assessment of driving risk	32 (31)	77 (73)	77 (73)	78 (74)
Narcolepsy	49 (47)	87 (83)	78 (74)	77 (73)
Insomnia	45 (43)	88 (84)	79 (75)	81 (77)
Restless legs syndrome	30 (29)	88 (84)	81 (77)	84 (80)
Sleep and its impact on diabetes	28 (27)	79 (75)	84 (80)	82 (78)
Sleep and its impact on dementia	26 (25)	78 (74)	81 (77)	84 (80)
Sleep and its impact on stroke	27 (26)	79 (75)	82 (78)	85 (81)

*Total number of respondents = 105.

Table 4 Items Rated as Having the Greatest to the Least Influence on Primary Care Physicians' Current Practice Style Regarding Sleep and Sleep Disorders (n = 105) Listed in Descending Order

Item	Mean (Std Dev)
1. Article in journals	2.7 (1.1)
2. Continuing medical education courses	2.6 (1.2)
3. Discussion with specialists	2.4 (1.2)
4. Discussions with peers	2.2 (1.2)
5. Textbooks	2.0 (1.2)
6. Prior training	1.8 (1.3)
7. Clinical practice guidelines	1.8 (1.3)

*Scale 0 = No Exposure, 1 = No Influence to 4 = Major Influence.

did diet and exercise. However, as with counseling on proper diet and the benefits of exercise, PCPs were not sure about whether or not it is cost-effective to counsel patients on sleep and sleep problems.

The results suggest that practicing PCPs would look favorably on educational interventions that include published findings in primary care journals and to CME courses with opportunities for interactions with specialists and peers about the issues of sleep disorders. However, we suggest that the current practitioner is missing at least one avenue for education. Searching Medline from January 1978 through early August 2002, we found 123 articles from 72 English-language journals searching the words "sleep disorders" and "primary care." Seventy-nine percent of these articles were published in the past 10 years and 60% in the past 5 years. One of the articles in 1996 was directed at PCPs and distributed widely through publication,[15] the Internet (www.nhlbi.gov), and pamphlet form through the NIH National Center for Sleep Disorders Research. Presumably, the dissemination of this material may have resulted in the higher rating for knowledge of sleep apnea rather than in developing critical knowledge and skills in the assessment of sleep disorders in general.

The impact of interventions in regard to CME for sleep disorders is unknown. Addressing transfusion practices, one study found that a CME presentation altered orthopedic surgeon behavior for at least 6 months.[16] For undergraduate and graduate medical education, there is somewhat greater impact of a chart reminder program for identification of sleep disorders than a sleep education program.[17]

Above and beyond these approaches is the general attitude of the practitioner toward the subject; it is correct to assume that the more positive the attitude the greater the impact of an educational intervention.[12] In this regard, the PCPs reported rather high regard for sleep, especially for sleep apnea, suggesting that there is a reasonable awareness of the need for more information and that educational efforts would be received favorably.

Whether or not CME can influence practice behaviors is still under scrutiny. Systematic reviews of randomized trials have shown that traditional, instructional CME simply fails to modify clinical performance and is ineffective in improving the health outcomes of patients.[18] In fact, there may be evidence to suggest that practitioners who attend CME courses on a given topic may be the very ones who need it least.[19]

The major limitation of this study is the low response rate. The six-page questionnaire took more than cursory effort. Our results may be biased. It is difficult to gauge whether PCPs otherwise interested in sleep and sleep disorders responded to the questionnaire or whether some other source of bias may be operating among respondents. Nevertheless, our findings suggest that greater effort should be expended to educate PCPs on sleep and sleep disorders. Their attitudes reflect only modest awareness of the sleep disorders in the populations they serve and their knowledge scores suggest a need for enrichment. As noted elsewhere, "the continuing failure to recognize sleep disorders in primary care medicine constitutes a major personal and public health crisis that absolutely must be addressed."[8] It is our contention that strategies to improve this situation start with well-designed educational interventions including peer expertise and exposure to the skills of sleep history in training programs.

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